

CLAIMS:

1. A vascular closure system, comprising:
 - a sheath being insertable into a vessel opening;
 - a snare being deployed on a first side of the vessel opening;
 - a suture being inserted through a second side of the vessel opening,and wherein the snare is configured to grasp the suture and extend the suture across the vessel opening; and
 - a pre-tied knot disposed on a proximal end of the suture such that the distal end of the suture can be directed through the pre-tied knot to approximate tissue surrounding the vessel opening.
2. A vascular closure system according to claim 1 wherein the snare comprises a wire loop having a memory that causes the wire loop to open in a repeatable orientation.
3. A vascular closure system according to claim 1 wherein the snare comprises a V-shaped wire loop having a memory that causes the wire loop to open in a repeatable orientation.
4. A vascular closure system according to claim 1, further comprising a handle set to allow an operator to control the deployment of the snare and the suture into the vessel, and wherein the pre-tied knot on the proximal end of the suture is releasably attached to the handle set.

5. A vascular closure system according to claim 1 further comprising a hub with a one-way silicone valve that allows devices to be inserted through the sheath while preventing bodily fluids from flowing out via the sheath.

6. A vascular closure system according to claim 1 wherein the pre-tied knot is configured to form a slidable knot that is capable of cinching down over the vessel opening when the distal end of the suture is thread through the pre-tied knot.

7. A vascular closure device, comprising:

a snare being insertable into a vessel on a first side of a vessel opening;

a suture having a distal end being insertable into the vessel on a second side of the vessel opening, the snare being configured to grasp the suture and retract the suture through the vessel wall on the first side of the vessel opening;

a pre-tied knot disposed on a proximal end of the suture, wherein the distal end of the suture is directed through the pre-tied knot to approximate tissue surrounding the vessel opening.

8. A vascular closure device according to claim 7 wherein the snare comprises a wire loop having a memory that causes the wire loop to open in a repeatable orientation.

9. A vascular closure device according to claim 7 wherein the snare comprises a V-shaped wire loop having a memory that causes the wire loop to open in a repeatable orientation.

10. A vascular closure suturing device according to claim 7 further comprising a handle set to allow an operator to control the deployment of the snare and the suture into the vessel, and wherein the pre-tied knot on the proximal end of the suture is releasably attached to the handle set.

11. A vascular closure device according to claim 7, further comprising a hub with a one way silicone valve that allows devices to be inserted through the sheath while preventing bodily fluids from flowing out via the sheath.

12. A vascular closure device according to claim 7 wherein the pre-tied knot is configured to form a slidable knot that is capable of cinching down over the vessel opening when the distal end of the suture is thread through the pre-tied knot.

13. A method of closing a vascular opening utilizing a vascular closure device comprising:

inserting a sheath into a vessel through a vessel opening;

inserting a snare into the vessel on a first side of the vessel opening;

inserting a suture into the vessel on a second side of the opening;

grasping the suture with the snare;

pulling the suture across the vessel opening and through the vessel on the first side of the vessel opening;

directing the distal end of the suture through a pre-tied knot formed at a proximal end of the suture to create a knot to approximate tissue surrounding the vessel opening.

14. The method of claim 13, further comprising cinching the knot to approximate tissue surrounding the vessel opening.

15. The method of claim 13, further comprising anchoring the sheath inside the vessel with a pair of extendable feet.

16. The method of claim 13, further comprising extending a safety wire into the vessel opening such that the safety wire can be used to facilitate reinserting the sheath if the snare fails to grasp the suture.

17. The method of claim 13, further comprising disengaging the sheath from the vessel and withdrawing the sheath from the vessel opening such that the suture remains extended across the vessel opening.

18. The method of claim 13, further comprising tightening the suture such that the suture approximates tissue surrounding the vessel opening.

19. A method of closing a vascular opening utilizing a pre-tied knot, comprising:
providing a suture having a free end portion and a pre-tied portion;
utilizing a suture device to position the suture across a vessel opening;
extending the free end portion of the suture through the pre-tied portion to form a pre-tied knot;
cinching the pre-tied knot around the vessel opening to close the vessel opening.

20. A method of automatically closing a vascular opening utilizing a pre-tied knot, comprising:
providing a suture having a free end portion and a pre-tied portion;
positioning the suture across a vessel opening;
extending the free end portion of the suture through the pre-tied portion to automatically form a pre-tied knot;
cinching the pre-tied knot around the vessel opening to close the vessel opening.